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ENGLISH FOREST

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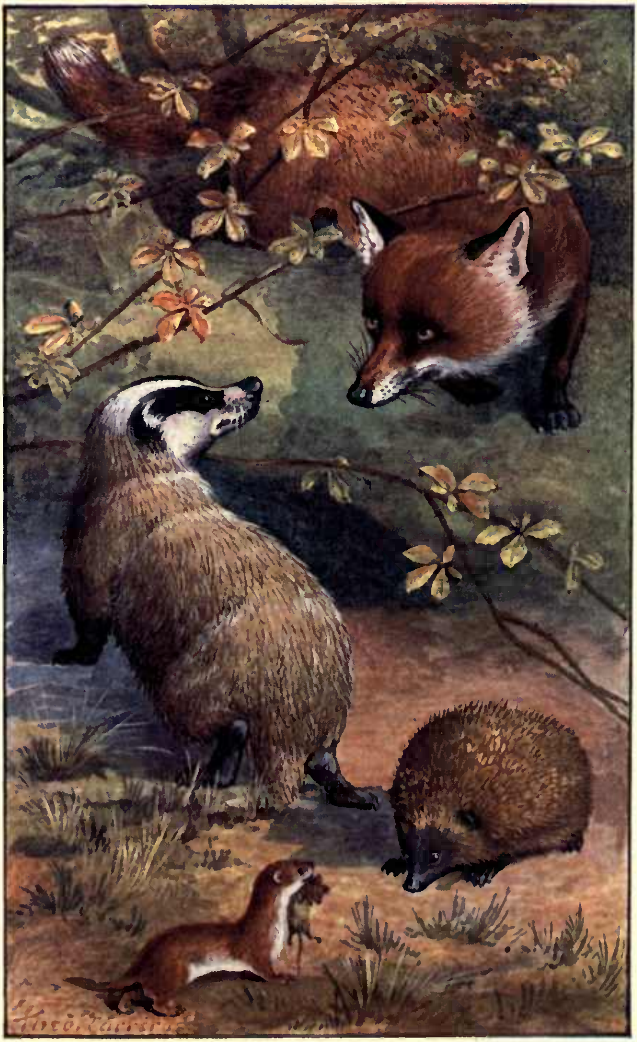
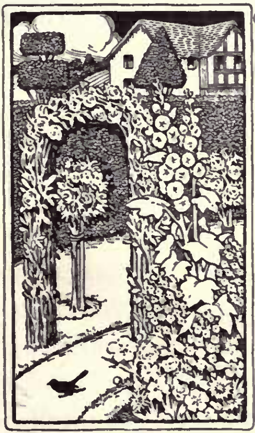
THE COUNTRY-SIDE SERIES



FOX, BADGER, HEDGEHOG, AND WEASEL.

THE
COUNTRYSIDE SERIES
BY ARTHUR O. COOKE

AN ENGLISH FOREST



LONDON
HENRY FROWDE
HODDER & STOUGHTON

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A ROAD IN THE FOREST.

CHAPTER I

THE FOREST

I WONDER how many of you have seen a forest. Some may have done so; but others, I feel sure, have never seen one, for there are very few large forests in England now—only three or four. Perhaps some of you who live in London have seen Epping Forest, which is one of the most beautiful in England.

Nearly two thousand years ago almost the whole of England was one great forest. There were hardly any towns, and there were few fields or meadows. Here and there among the trees of the forest were small villages. In some

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of these the people lived in rude huts made by twisting together the branches of trees; in others the only dwellings were holes in the ground, covered with roofs of branches and earth.

The people who lived in these forest villages had very few crops. Some of them cultivated a little corn, but most of them lived by hunting. There were plenty of wild animals in the forest which surrounded them; there were deer, wild cattle and pigs, and also bears and wolves. The people lived on the flesh of these animals, and clothed themselves in their skins. Some of them kept a few small cattle and also herds of pigs.

Then, as you know, the Romans came and conquered England. They taught the natives many things that they did not know before. They taught them to make roads, to build houses of stone, and also to grow many crops. Little by little the forests were cut down to make room for fields and meadows. The wild animals became fewer and the people hunted less. They kept more cattle and grew more crops; they became a "pastoral" and "agricultural" people.

Some people think that now we have not

enough forests in England. It is certain that we have not enough to supply us with all the wood we need. We are compelled to buy a great deal of wood from abroad—wood for building houses, for making furniture, for the masts of ships, and for many other purposes.

It happens that one of the largest and most beautiful forests in England is not very far from a place where I often stay, a place called Willow Farm. Perhaps some of you have read about Willow Farm in another book. If you like to fancy that you are there with me now, we might pay a visit to the forest. It is rather too far off for a walk, but not too far for a drive. We will ask Mr Hammond, the farmer, to lend us the pony-cart and the brown pony Billy for the trip.

So one morning, after breakfasting early that we may have a nice long day in the forest, we set off.

The road winds in and out among fields and farmhouses for several miles, and we pass through one or two villages. Sometimes we go up a steep hill, and then we get out and walk to make it easier for Billy, who is getting rather old and fat. Sometimes we have a hill to go down; that is almost as slow work as going up, for Billy is very careful and very much afraid of falling down if he goes too quickly. It is a good thing that we started early.

At last, when we reach the top of a long hill, we see before us a great mass of trees, which stretches away as far as the eye can reach. This is the forest, and very soon we are driving along in the cool shade between the trees.

There is no hedge nor fence on either side of the road, and every now and then we see a tempting footpath winding among the trees. Before we say good-bye to the forest we will stroll along more than one of these paths, but not just now. Billy is tired with his journey, and we must take him to a stable where he can rest and have some food. In a few minutes we come to a large house at the roadside, which is called the Court House Inn.

When we have asked the ostler to feed the pony and take care of him until the evening, we will go inside the inn for something to eat ourselves before taking a stroll in the forest. The room into which we are shown is very large, and at one end is an old wooden platform. A railing divides this platform from the rest of the room, and behind the railing are large wooden seats ; one seat in the middle is very high, like a great arm-chair. Hanging on the walls of the room are many heads of deer. These are the heads of deer killed in the forest years ago ; they have hung on the walls so long that on some of them there is no fur left, only the bare bones of the skull.

THE OLD COURT HOUSE.

This old house has not always been an inn. Centuries ago the Forest Court was held here. As more and more fields were made in England the forest grew smaller, and as the forests grew smaller the deer and wolves and wild pigs became fewer. The kings and great men, who loved hunting, began to fear that there would soon be none for them to hunt. To prevent this the kings made strict laws to guard the wild animals that still remained.

By these laws only the kings themselves, or the nobles and great men to whom they gave permission, were allowed to hunt in the forests. If anyone else was found hunting, or even disturbing or frightening the deer by cutting wood in the forests, he was severely punished by the Forest Courts. This inn was once the Court House for our forest; in this room, where we are quietly eating our lunch to-day, many a man has been punished for some crime against the Forest Laws.

CHAPTER II

THE "GREAT OAK"

THREE roads meet outside the Court House Inn, and there are paths which lead into the forest in all directions. By and by we will follow a path, but just now I want to take you a little way down one of the roads.

The ground under the trees on each side of the road is covered with soft turf, and in many places there is beautiful green fern or bracken as high as your shoulders. All round we hear the tinkling of bells; some are quite close to us and others sound far off among the trees. They are sheep-bells, for sheep are feeding all about upon the soft sweet grass. The bells keep the flocks together, for the sheep of one flock soon learn to know the sound of the bell hung round their leader's neck.

Most of the trees just here are oaks, but there are a few fine beeches. Dotted about, too, are a great many hollies, for this part of the forest is the Holly Wood. Presently we will look at a beech and at a holly too; but first I want to show you this very large oak, which stands in a clear space a little away from other trees.

It is not very tall; there are many taller oaks in the forest, but none have so thick a trunk. If you would like to know how thick the trunk is we can soon find out; I have a measuring-tape in my pocket, which is marked with feet and inches. Will you stand close to the tree and hold one end of the tape against the trunk five feet from the ground? I will walk round the tree, unwinding the tape as I go.

When the tape is stretched tightly round the trunk and I have brought my end to yours, we read the figures on the tape. It has taken forty-four feet and eight inches of tape to go round the trunk ; forty-four feet eight inches is the " girth " of the tree. From side to side the tree is about fifteen feet thick.

That is a great size even for an oak, and there are very few larger oaks than this one in all England. The tree must be very old, and some people would tell you that it is more than a thousand years of age. If it is not really quite as old as that, I daresay it has stood here eight or nine hundred years, which is a long time for a tree to live.

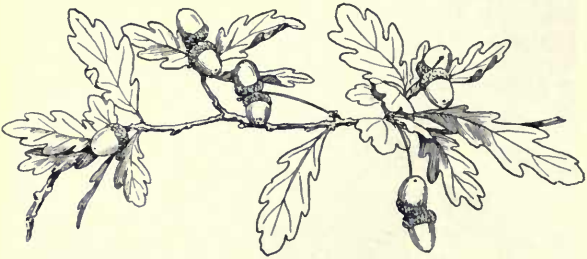
Besides its great girth, there are other signs of age about this oak. Let us stand a little way off and look up at it. On this June day there are many leaves on it, but none on the topmost branches. These branches stand out quite bare above the green leaves and look very like the horns of deer ; the tree is called " stag-headed." Though living still it is growing feeble, and has no longer the strength to produce leaves on its upper branches.

The bark which covers the trunk and large boughs is brown and rough, and is split all over by long deep cracks into which you can put your finger. On the trunk are several great rough lumps called "burrs"; they are another sign of age.

THE "GREAT OAK."

The leaves are something like the shape of a kite; they are narrow where they join the twigs, grow broader towards the middle, and become narrow again at the end. These leaves grow direct from the twigs; they have no "leaf-stem" of their own. When this old tree bore acorns *they* had short stems called "peduncles," for this is a "pedunculate" oak.

Other oaks grow in some parts of England which are called "sessile" oaks. *Their* leaves have leaf-stems, while the acorns have none, but grow in clusters, "sessile," or "seated" on the twigs. Nearly all the oaks in our forest are pedunculate.



BRANCH OF "PEDUNCULATE" OAK.

Although the trunk of this old oak is so thick it is not more than twelve or fifteen feet high. At that height from the ground the tree divides into several great branches. Some of these spread out above our heads; others have grown upwards in a slanting direction. All are a good deal curved. Some have evidently been broken off, for we can see their stumps left on the tree.

This is the shape in which a pedunculate oak grows naturally; it has a short thick trunk, which soon divides into branches more or less curved in shape. Until recently this was the shape in which the oak was most useful. Why? Because, when all our ships were made of wood, a great many curved and crooked pieces of timber called "knees" were required for building a ship's inner framework—the part which you do not see when looking at a ship from outside. These knees were easily made from the curved and crooked branches of an oak like this, and also from the great "root-arms"—the upper parts of the roots which we can see branching from the trunk above the ground.

But nowadays very few ships are made of wood; they are nearly all built of iron and steel. Very few crooked knees are required. Instead of these, long beams of oak are often needed for many purposes. Sometimes a beam is wanted thirty or forty feet long and quite straight.

Look again at the old oak. It is, of course, far too old and decayed now to make good timber. Let us suppose, however, that it is a fine healthy tree, fit to cut down and use for timber. Can you see any part of it that would make a beam thirty feet long and quite straight?

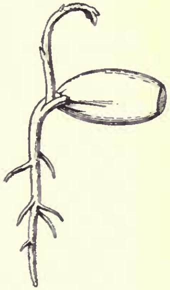
The trunk certainly will not do so; that is only about fifteen feet high. The branches are so crooked and curved that the longest of them has not more than ten or twelve feet of straight wood. Where is our long straight oak-beam to come from? Presently we will see if we can find it; but first let us rest a little beneath the branches of our oak and think how it grew.

CHAPTER III

HOW THE "GREAT OAK" GREW

Eight or nine hundred years ago a fine oak stood not far from where this old oak stands to-day. Nearly every year it bore a crop of fruit—thousands of acorns. In the autumn, when the acorns were ripe and began to fall, large herds of pigs were driven into the forest to feed on them. Pigs are now generally fed on meal, potatoes and milk. In those days there was but little meal or milk to spare for pigs, and there was not a single potato in all England.

One fine October day a herd of pigs was searching for acorns among the grass and fallen leaves beneath the oak. There was a fine plump acorn lying just in the way of a hungry pig, but it was hidden by a dead leaf, and so it happened that the pig did not see it. He set his foot on the leaf as he passed and pressed the acorn down into the soft damp ground.


ACORN SHOOTING.

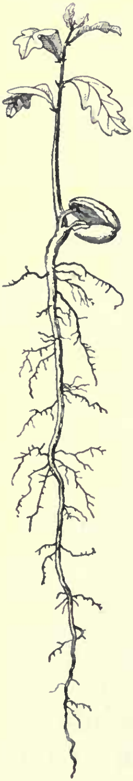
For six or seven months the acorn lay in the ground. Inside it was the kernel or seed; this was the same shape as the acorn, but smaller, with a rough brown coat. By and by a tiny thread-like root grew from the smaller pointed end of the seed; the outer shell of the acorn split in half, and the tiny thread came through.

I do not know how this particular acorn had been lying; perhaps on its side, or with the pointed end turned upwards towards the surface of the ground. But as soon as this little root appeared, it, *i.e.* the root, at once turned downwards and began to grow straight into the earth. It was the little "tap-root" of our oak.

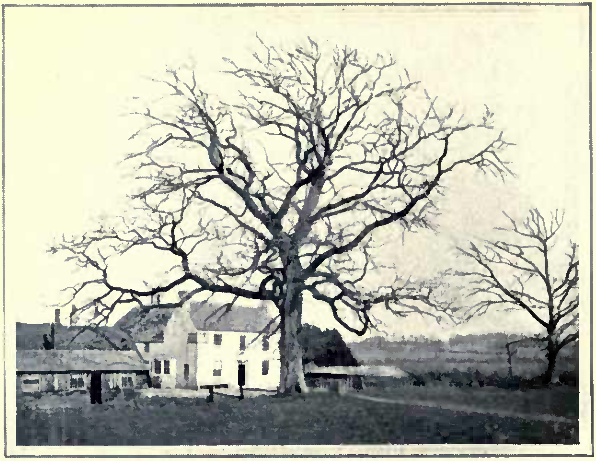
When the tap-root was about three inches long something else appeared from the small end of the acorn—a tiny shoot. The little tap-root had turned *down* into the ground, but the little shoot grew *up* towards light and air. It was to be our great oak's trunk.

Can you think why the root appeared and grew down into the ground *before* the young stem came from the acorn? If the stem had appeared first, or as soon as the root, the little tree would have grown top-heavy, and would perhaps have been blown over by the wind. This did not happen, because the root came first and had taken a firm hold of the earth before the stem began to grow.

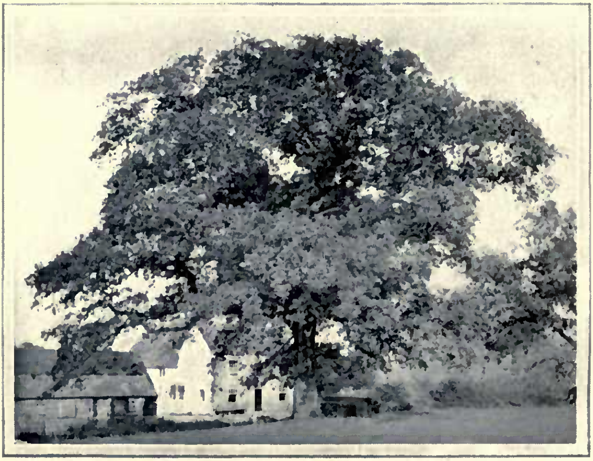
At two years old the root was about eighteen inches long and the stem six inches high. Buds had appeared on the stem, and these opened in the spring and produced leaves. From between the leaves fresh shoots grew,


TWO-YEAR OLD OAK.

THE LEADER OF THE FLOCK.



AN OAK IN WINTER.



THE SAME OAK IN SUMMER.

which by and by became the crooked branches of the oak.

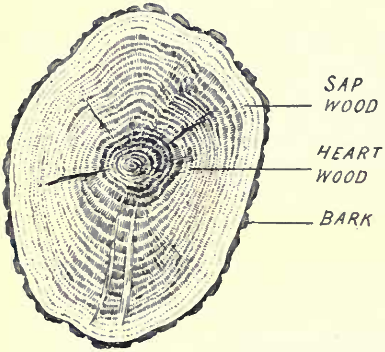
Meanwhile, deep in the ground, the tap-root grew longer and stronger; other roots grew round it in the earth below the tree. When high winds blew the tree swayed to and fro, but it did not fall, for the strong tap-root and the other roots held it fast.

The roots drank in the moisture from the soil. This moisture was not pure water; in it were dissolved various things which the tree needed for food. A tree gets much of its food through its roots, and they can only take in *liquids*.

Have you ever sucked up water through a straw? Perhaps so; it was quite easy, was it not? Well, have you sucked up a lump of sugar in the same way? "Why, no," you say, "that would be impossible!" Are you quite sure of that? Dissolve your lump of sugar in a glass of water or a cup of tea; *now* if you suck up the tea you have the sugar as well.

That is how our oak obtained food from the soil. The water carrying the needed food flowed upwards through the roots, and through the trunk and branches till it reached the leaves. All the food from the soil went to the leaves.

The leaves themselves were busy in another way. They gathered from the air a certain part of it which the tree needed. They mixed this with the substances brought up in the water from the roots; then they sent this mixture back into the branches and trunk as food for the tree. Before the first leaves appeared on the little tree it lived on the store of food contained in the acorn from which it grew.

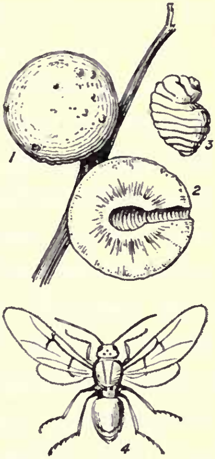


SECTION OF OAK TRUNK.

This food made the oak grow in height and in thickness; it made *wood.* Each year a new layer of wood grew just beneath the skin all round the tree. When quite new this wood was very soft and damp; it was "sap-wood." As other layers grew over it, it became harder and drier—it became "heart-wood." It is this heart-wood which is the valuable wood of a tree.

While the oak was quite young the stem was covered with a soft and tender skin. It was many years before this gave place to the bark which we see upon its trunk and branches to-day.

A great deal of water was drawn in by the roots of the oak. What became of it? Much of this water was "transpired," or breathed out, into the air by the leaves. More than two hundred times its own weight of water may pass through an oak in a year. Where there are many trees there is always moisture in the air; houses surrounded by trees are often damp.



1. OAK GALL. 2. SECTION SHOWING LARVAL CHAMBER. 3. LARVA. 4. IMAGO.
1 and 2 natural size, 3 and 4 much enlarged.

All this work of taking in moisture and air, and of making wood, went on in spring and summer. In winter, when no leaves were on the tree, it rested.

Year by year our oak grew large and strong. When it was about sixty years old it bore its first crop of acorns, and it continued to bear acorns for many years. Sometimes the crop was large; but if a late spring frost had nipped the blossoms of the tree, there would be very few acorns in autumn.

Sometimes oak-apples or galls appeared upon the twigs in spring. These grew there because an insect had laid an egg in the twig; the egg became a grub, and the presence of the grub made the twig unhealthy. The oak-apple is pretty, but it is not the natural healthy product of the tree.

A hundred years went by, then another hundred, and our oak grew old and past its prime. Some of the great boughs grew rotten and broke off in gales of wind. The tree could not put out so many leaves in spring as in its younger days; the upper branches grew stag-headed, as they are to-day.

But old and stag-headed as it is, there is life in the great tree still. The leaves upon its lower branches make a pleasant shade in which to sit. People speak of the tree with interest, pictures of it are painted, and every visitor to the forest likes to see the "Great Oak."

CHAPTER IV

YOUNG OAKS

We said that we would try to find in the forest an oak-tree which would give us a straight piece of timber thirty or forty feet long. We have rested for half an hour, and I think I know where to look for one.

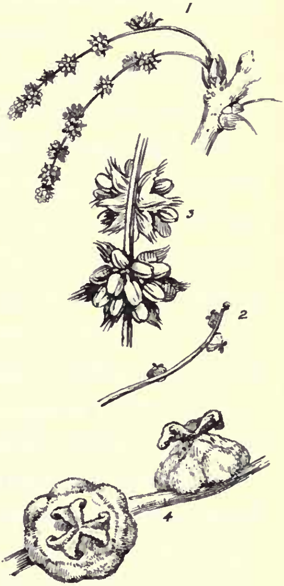
Not far from the Great Oak we come to a part of the forest which is enclosed by a fence. This looks as though we may not go in, but after walking by the fence for a hundred yards we come to a gate with a stile beside it. The gate is locked, but wherever there is a stile in this forest we may cross it and follow the footpath beyond.

When we have crossed the stile we find ourselves once more among oaks. They are, however, very different trees from the old oak. That was in a clear space by itself; these stand closely together, and you would have to cut down several to make room for the spreading Great Oak. These oaks are nearly as tall as the old one, but their trunks are very much thinner; we measure one with our tape and find that its girth is only six feet. Do you see another difference too? There are no branches growing on the trunks of these oaks for the first twenty feet or so from the ground. Higher up are a few small branches, but we have to look almost to the top of a tree before we see many; even these are not very large.

You wonder perhaps why these oaks, though nearly as tall as the old oak, have so much thinner trunks; you wonder also why there are no branches near the ground. The answer is, "Because these oaks have been *made* to grow in this way."

"How can a tree be *made* to grow in a certain way?" you ask. We will see.

A tree, you know, is only a large plant. Some of you grow flowers, I hope; you may have a garden at home or a greenhouse. Even if you have neither garden nor greenhouse, many of you have a plant of some kind growing in a sunny window. You have a geranium, perhaps. Your geranium has a stem, branches, leaves, flowers and seed. A tree, like the oak we have been looking at, has all these. The stem and leaves and branches we saw. The seed of the oak is the kernel inside the acorn; this we have not seen to-day, for acorns do not appear till autumn. Nor have we seen the flowers, for they appear earlier in the spring. The flowers of many large trees are small and not easily seen.



OAK FLOWERS.
1. male catkin (natural size)
2. female ,, ,,
3. male ,, (magnified)
4. female ,, ,,

You keep your geranium in a window because you know that all plants require light. Supposing that one day in the spring you took it from the sunny window, carried it up to an attic where there was only a skylight in the roof, and left it there upon the floor. Do you know what would happen? The geranium would begin to struggle up towards the light above it. It would not send out good branches or grow into a nice bushy plant as it does in the window. Its main stem—the trunk—would grow long and " leggy " from trying to reach the light.

The oak, like every other plant and tree, wants light ; indeed, the oak demands a great deal. The old oak stands in a clear space ; the sun can shine all round and give it plenty of light. It therefore grew in its natural manner, sending out many branches from the top of a short stout trunk.

But the forester does not grow trees entirely for the sake of their natural beauty. He wants timber which he can sell. These short trunks and strong crooked branches are not much wanted now ; long straight stems are more needed. What does the forester do ? He plants his young oaks close together.

Then what happens ? Exactly what happened to your geranium. Each young oak finds itself surrounded by a number of neighbours which keep the light from shining freely round it. Up above, however, there is the open sky and plenty of light, so each young oak grows upwards towards the light as quickly as it can. The strength and energy of the tree are used to climb with, and very few branches are formed. In sixty years or so oaks grown in this way will have a straight trunk much taller than that of our old oak nearly a thousand years of age. Their topmost twigs will not perhaps be as high up as the topmost twig of the Great Oak ; that does not matter, it is the trunk which the forester wants. As you see, he has *made* his oaks grow in the way he wished.

He must not grow them too closely together, and as they grow larger he must allow them more and more space. When this plantation was first made, the young trees stood only a few feet from each other—two or three feet apart is the proper distance. As they grew, some were cut down to give more room to their neighbours, and more were cut down from time to time. At last, when the trees are nearly as tall as he requires them to be, the forester will begin to let more light in gradually by cutting down still more trees.

He will be careful not to let in too much light —not to break the canopy formed by the tops of the trees. When the trees get light without having to climb towards it they will begin to grow rapidly in girth.

I think some of these oaks would give us a beam thirty feet long and quite straight. But their trunks are still slender and they will be allowed to grow much thicker before they are felled. An oak is not in its prime till it is a hundred and twenty or a hundred and thirty years old; many oaks are allowed to stand longer than that. Still the young trees cut down from time to time to make room for the others can be used for many purposes.

CHAPTER V

THE HOUSE BY THE RIVER

In the days when all ships were made of wood and our ships were really the "wooden walls of England," a great deal of oak from this forest was used for ship-building. The forest is a long way from London or from any large seaport town where ships were built. There were no railways in those days, and it would have been a long and weary journey for horses to draw the timber on waggons to the nearest place where it was wanted. We will find out how the timber was taken to the shipyards.

Let us suppose for a little that we are living more than three hundred years ago, and that a large tree near our old oak has just been cut down. The trunk and branches are placed on strong timber-waggons, or perhaps on sleds without wheels. Then the great teams—eight or ten horses to each waggon—set off down the road and we will follow them.

After two or three miles the road leaves the forest. Presently we go through a large village; then out again among the fields. At last the road begins to descend a narrow winding lane between high banks; beside the road there flows a little tinkling stream. All the way we go the roads are hard and firm to-day; if it were really three hundred years ago they would be only rough cart-tracks, with deep ruts and much mud.

DRAKE'S HOME.

At the bottom of the lane is a tiny village or hamlet, and beyond this is the shore of a broad river more than a mile wide. The hamlet is a very small place; there are only eight or nine cottages, and one house, rather larger than the others, which stands close to the shore. Over the doorway of this house there is a low stone porch.

If it were really some three hundred years ago we might hope to see a very famous man standing in this porch—a man of whom I feel sure you have all heard. I mean Sir Francis Drake, the great seaman and admiral who lived in the time of Queen Elizabeth. It is said that he often stayed in this house.

Can you guess why he stayed here? You see he was a great seaman, and he wished to sail in good and well-built ships. In those days if ships were to be good they had to be built of good sound timber. When Drake came down here it was no doubt because he wished to see that only the very finest timber from the forest was being used to build the Queen's ships.

There was another reason too which may have brought him here. At that time we were at war with Spain, and the Spaniards knew that many of the ships in which the English seamen sailed and fought were built from timber grown here. The Spaniards had a plan to send a small vessel up this river to put ashore some daring men who would set fire to the forest.

As a matter of fact our forest would not have been easy to burn—indeed it would hardly have burnt at all. Forests will burn easily in some hot dry countries; and probably the Spaniards did not know that a forest of oaks in a moist climate such as we have would be a very difficult thing to set on fire. Still Drake did not wish them to try, and I have no doubt he kept a sharp look-out in case a Spanish ship should come in sight.

ONE OF DRAKE'S SHIPS.

We were supposing that we had followed a load of timber down here. This little hamlet was the port from which most of the forest timber was sent to the dockyards. It is very quiet here to-day; only one or two women and some children are to be seen. There are a few fishing-boats lying on the beach; some are even in the little village street, for at high tide the water flows up between the houses.

In Drake's day this was a very busy place. There was a pier stretching out into the deep water of the river, and we might have seen several small vessels waiting to be laden with the timber.

The pier has fallen to pieces long ago, and there are no ships lying off the shore to-day. All the timber that is now cut in the forest is taken away by the railway. Still any village where the great Sir Francis Drake has stayed is worth a visit, is it not?

CHAPTER VI

EVERGREENS

When we were last in the forest it was a day in June, and now it is November. Perhaps you do not think winter a very good time for another visit, but a fine winter's day in the woods is very pleasant. In summer the forest is cool, for the leafy branches shade us from the sun; in winter it is warm, because the trunks and branches of the trees shelter us from cold winds.

If there were only "deciduous" trees in our forest it would be very bare to-day. "Deciduous" trees are those which drop their leaves every autumn and do not get the new ones till the following spring. Oaks and beeches are both deciduous trees, and to-day there is not a green leaf on either oak or beech. The leaves on the beech-trees which we pass have turned a beautiful ruddy brown; those of the oaks are duller and paler in colour. From both beeches and oaks the leaves are falling ceaselessly with a loud pattering sound like rain, for they are now quite dry and crisp.

Under the trees the bracken which we saw so green and fresh in June has all turned brown. A great deal of it has been cut and carted away, for bracken makes a very good bed or litter for horses and cattle; it does instead of straw. The grass is still green, but it is thickly covered with the fallen leaves.

The faded leaves upon the trees and on the ground, and the dead bracken, would make a very brown picture if there were nothing else to see. But there are plenty of green leaves in sight just here. We are standing at the edge of the Holly Wood, and the fine hollies with their shining leaves and crimson berries make a beautiful picture. We notice them more to-day than we did when all the other trees were green in June.

Hollies and yews, with many other trees, are evergreens ; they do not drop their leaves every autumn and remain bare through the winter. You must not think, however, that an evergreen tree keeps the same leaves on its branches all its life. It is an evergreen because, before the old leaves drop off, the new ones are ready to take their place. Looking at a holly from a distance you might not notice any difference in its leaves all the year round. If you look at it closely in the spring or early summer you will see that a great many of the leaves are quite young and fresh. They are lighter in colour than the old ones, and their points are not yet so hard and sharp. You would also find many dead brown leaves upon the ground below the tree.

There are two or three thousand holly-trees in this wood, and they are all about the same age—about two hundred and fifty years old. Of course the holly is a mere bush compared with an oak or a beech ; the very largest holly in the wood has a girth of about eight feet, and few are more than half that size. Their stems are covered with a smooth, light grey bark.

BRANCH OF HOLLY.

I suppose most of you have seen a sprig of holly at Christmas-time, and know how bright the crimson berries are. Many of the hollies here are thickly covered with berries and are a beautiful sight. Others have none, but even these are bright and cheerful though their leaves are dark. The upper side of a holly leaf is so smooth and glossy that it reflects the sunshine like a looking-glass.

There are some yews here too; they are beautiful, but not perhaps very cheerful-looking trees. The dark green leaflets are about an inch long and very narrow—a dozen of them placed side by side will hardly measure an inch. They are set very closely together in two rows on opposite sides of the twig. The lower boughs grow very near the ground, and the thick mass of leaves makes a dark and gloomy shadow beneath and round a yew.

There are red berries on the yew we have been looking at, and as we came up to the tree a thrush flew out. Thrushes are very fond of these berries; we, however, will not taste them though they are rather sweet, for the seeds which they contain are said to be poisonous. Some people say they are not; but as a friend tells me he has known pheasants poisoned by eating them, I think we will be on the safe side and leave them alone.

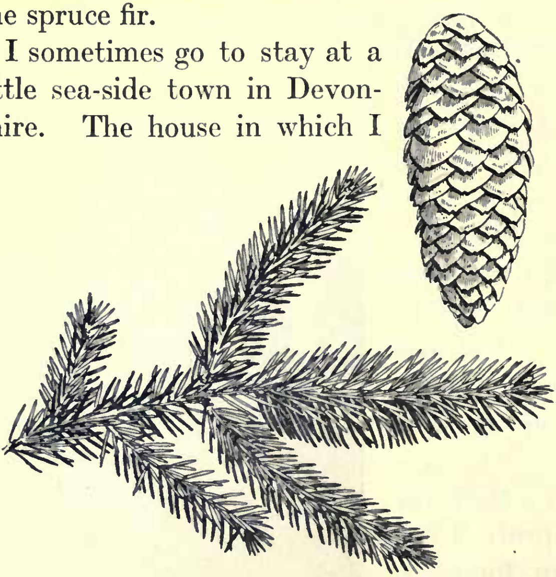
The leaves are a deadly poison to human beings and to horses. If you ever have a horse do not put him in a field where there is a yew, nor leave him where he can reach one. Many horses have died from eating only a few mouthfuls of the leaves. It does not seem certain whether they will also poison cattle; some people say so, but others think not. Sheep have sometimes been known to die from eating yew leaves; yet other sheep have been seen to eat them and suffer no harm.

We saw what an important tree the oak was in the days of wooden ships. In still earlier times the yew was also important. Before gunpowder was invented many bowmen or archers fought in our battles; every one of them carried a bow made of yew, for the wood is very strong and tough.

BRANCH OF YEW.

We have strolled through the Holly Wood, and now get over a stile. At once we are on a broad grassy path between two beautiful green hedges which stretch before us in a and a great many magazines are now printed on paper which is made from wood pulp ; this wood pulp is mostly made from the wood of the spruce fir.

I sometimes go to stay at a little sea-side town in Devonshire. The house in which I stay looks out on the harbour, and the ships pass in and out only a few yards from the windows. When I first went there I soon noticed one steamer which came into the harbour about every fortnight or three weeks ; she was called the *Belle of Devon*. Her hold was full each time she came, and even her



BRANCHES AND CONE OF SPRUCE.

deck was piled with large square packages. I said to a friendly fisherman one day, " Where does that steamer come from, and what is her cargo ? " " Oh," he said, " she comes from Sweden with wood pulp."

We use so much paper in England and grow so few spruce trees, that we have to import a great deal of this pulp from abroad. That one steamer brought several hundred tons every few weeks. Spruces are also used for ladders, and for other purposes where a long straight stem is needed. This beautiful drive is only planted as an ornament to the forest.

We have walked for some time between our two great hedges, but still we do not see the end, for the drive is two miles long. Here and there are vacant places in the rows ; then the tall trees begin again.

We saw that the oak has a large tap-root which goes far down into the ground. Some trees have long tap-roots ; others have not, and the spruce is one of these—it is a " shallow-rooting " tree. Its roots spread out not far below the surface of the ground.

This is the reason of the gaps in our hedges. Why ? Because the spruce has not so firm a perfectly straight line as far as we can see. Very high our two hedges are—fifty or sixty feet, perhaps even more! They are really two rows of tall spruce firs, and the trees are set so closely together that we cannot see between them.

In talking about the spruce we must use two long words. One tells us what the tree *is*, the other tells us what it is *not*.

It *is*, like many other evergreens, a "conifer"; that is, it bears cones. We see some of them on the trees to-day, hanging from the ends of the branches. They are about five inches long, and pointed at the end; under the rough scales with which the cones are covered lie the seeds.

The short leaves or needles grow closely all round the twigs; not, like those of the yew, on two sides only. They end in a sharp point and are well called needles. These needles remain on a spruce for six or seven years.

The spruce is *not* "indigenous" to our forest. "Indigenous" means native. Oaks, beeches, yews and hollies are natives of England; they are indigenous. The spruce is not so, but was brought to this country from the continent of Europe a few hundred years ago.

These trees are very fine, with their tall straight stems and their spreading branches, of which the lower ones sweep the ground. The Spruce Drive, as this walk is called, is one of the sights of the forest. Then too the spruce is a very interesting tree to us. I hope some of you have seen a Christmas-tree; that was a spruce, I feel sure, for thousands of young spruces are sold in London every year for Christmas-trees.

SPRUCE TREES.

You may also have met the spruce where perhaps you did not recognise it. You have met it when you were reading some magazine. But the magazine was made of paper! Yes, hold upon the ground as the oak has, and therefore strong winds often blow one down.

The spruce too, being an evergreen, is more top-heavy than the oak. Most gales of wind come in autumn or winter when oaks and other deciduous trees are leafless, or nearly so. The wind can then blow through their bare branches. The leaves or needles of the spruce are always on the boughs ; thus they prevent the wind from blowing through easily, and the tree is often uprooted.

CHAPTER VII

BEECHES

At the end of the Spruce Drive is an open space or clearing, in the middle of which stand five or six fine beech-trees. The grass beneath them is thickly covered with the ruddy fallen leaves, and many more are still falling. The beech bears a great number of leaves ; it is what is called a tree of "dense foliage."

When the leaves of deciduous trees fall in autumn and decay upon the ground, they give back to the soil some portion of the food which the roots have taken from it. Beech leaves give back more food than those of any other tree, except, perhaps, the Hornbeam; they mix with the soil and make a great deal of what is called "humus."

For this reason beeches are suitable to plant under other trees; that is, it is a good plan to plant young beeches among tall well-grown trees. Oaks are often "underplanted" with beeches in this way. The beeches will then shade the ground, and this is good for two reasons. The soil is kept cool and moist, and is not likely to become dry and parched; also the thick shade of the beeches destroys weeds which would otherwise grow there and would rob the trees of food.

So the beech is a valuable tree to the forester because of the richness of its leaves, and because it will grow well in partial shade. Its wood is not so hard and tough as that of oak, and is generally much less valuable. In the county of Buckinghamshire, where many beeches grow, chairs are made from the wood; it is also used for carpenters' tools and for "turnery,"—such things as butchers' trays and wooden bowls. In France, wooden shoes, called "sabots," are also made from beech-wood; and both in France and Germany the wood is much used for fuel, for a fire of beech-logs gives more heat than that of almost any other kind of wood.

The leaves are shorter and rounder in shape than those of the oak. Although the beech is a deciduous tree the leaves sometimes remain on the trees till they are pushed off by the new leaves in spring; this however rarely occurs except on young trees or on a hedge of beech.

BRANCH OF BEECH, WITH MAST.

Formerly, and perhaps even now, beech leaves were much used on the Continent for stuffing mattresses. If the leaves are gathered early in the autumn, before they have been nipped by frosts, they do not decay, but last fresh and crisp for many months. Thus they make a very comfortable bed.

The beech-trunks are not nearly so thick as the trunk of our old oak. There is another great difference; the bark is not brown and rough, but smooth and silvery grey. The trunks are taller than that of the Great Oak, and the branches into which the trunks divide still grow upwards; they do not spread out horizontally as many of the oak boughs do.

The fruit of the beech is the nut or "mast," and to-day there is plenty of it on the ground among the fallen leaves. Another autumn perhaps you might find none, for beech-mast does not ripen every year. The mast is quite different from the acorn, though it is brown and smooth. Each nut has three sides, and the edges are rather sharp. The nuts grow in prickly cases, each of which holds two nuts.

Hundreds of years ago the beech was, in one way, as valuable as the oak to the country people of England. Pigs like the mast as much as they like acorns, and they were largely fed on it. Deer like it too. To-day pigs have other things to eat, and the last of the deer were taken from the forest many years ago.

Still there is someone left to eat the mast. I thought of him as we came down between the spruces, and hoped that we might find him here.

CHAPTER VIII

A SQUIRREL

While we are standing between two of the beeches we see something moving on the ground a little way off. That is nothing strange to-day for there is a strong breeze which blows the fallen leaves about. Still, if what we see now is a beech-leaf it is a very large one—about a foot long! It is almost exactly the colour of a beech-leaf certainly—a beautiful ruddy brown.

Suddenly it bounds away across the fallen leaves and runs up the trunk of a beech till it is thirty feet above our heads; then it crouches on a branch and makes a sharp chattering noise. No beech-leaf, however large, would do this; we see that it is a little animal covered with ruddy brown fur, and that it has a long and bushy tail. It is a squirrel.

Here, you see, is another reason why it is pleasant to be in the woods in winter time. When the trees are bare, or nearly bare, it is easier to see what is going on in them. In summer the dense foliage of the beech would soon have hidden the squirrel from our sight; to-day we see him well.

Though we want very much to look at the squirrel, he seems to have seen enough of us. As we walk nearer the tree he runs back along the bough and begins to climb higher up the trunk. He climbs on the opposite side to that on which we are; as soon as we walk round the tree to get a peep at him, he too changes his side and so keeps the great trunk between himself and us.

You wonder how he can climb the smooth trunk so fast and well. He has five little toes on each hind-foot, and four fingers and something like a thumb on each fore-paw. Each of these toes and fingers has a sharp strong claw with which he can cling to the smoothest tree quite easily. Then too he can leap—we saw what bounds he made on the ground. Up in the trees it is the same; he can spring from one tree to another, and in this way can travel for a long distance through a wood without coming down to the ground.

He will not leave this tree without coming down, for the beeches stand too far apart for even a squirrel to leap. I think that if we go a little distance off and hide he will soon be down again. The beech-mast is one of his favourite foods, and that was what he was looking for when we disturbed him. Let us hide behind another tree and wait.

There! he is down again. He is very cautious at first, but as he sees nothing of us he grows bolder. Soon he is busy picking up the beech-nuts with his fore paws. Each time that he finds a nut he sits up on his haunches and curls his bushy tail over his back. Then we see that though his back and sides and tail are reddish brown, his breast is white. With his bright black eyes, his sharply pricked ears and his quick movements, he looks "all alive."

A great many of the nuts which he picks up he throws down again. There is no better judge of an acorn, a walnut, or beech-mast than a squirrel. If *he* throws down a nut then *you* need not trouble to pick it up; you may be quite sure that that nut is not a good one.

I once had a very good view of a squirrel choosing nuts. A few yards away from my study window there is a large old walnut-tree. On the other side of the house is a small wood or shrubbery with several large trees in it. I was at work by the window one morning in the autumn, when suddenly I saw a squirrel run across the lawn to the walnut-tree. You may be sure that I stopped writing and kept my eyes on him.

He searched about under the tree and soon picked up a walnut; after a moment he threw it down again and he did the same with several others. Presently he seemed to find a nut which he liked, and off he went with it across the lawn to the shrubbery. Soon he came back again; indeed he was to and fro between the shrubbery and the walnut-tree for nearly an hour. I did not get much writing done that morning, but then I learnt a good deal about a squirrel.

Now one of the walnuts which he had thrown down had rolled to a place where I could see it. When the squirrel did not come back any more I went out and picked up this walnut.

It seemed a very good one; at any rate the shell was quite good. When I opened the shell I could see nothing wrong at first. Looking more closely, however, I saw a spot where the kernel of the walnut was just beginning to decay. The squirrel had found out this without opening the shell.

That squirrel took his nuts away to the shrubbery, where I afterwards found out that he lived. Our squirrel to-day runs up the tree when he is pleased with a beech-nut, and disappears in a corner between the trunk and a large bough. What is he doing?

To answer that I must use another long word. Long words look hard to understand I know; still, the older you grow the more long words you will find in books. You may as well begin to understand a few at once.

The squirrel is an animal which "hibernates." To "hibernate" is to sleep during the winter—not in the night only, but in the day as well. That is what a squirrel does; several other animals, both in England and in other countries, do the same.

I do not mean that the squirrel goes off to sleep on the very first day of winter and

A FINE BEECH.

OLD BEECHES.

SQUIRREL.

never wakes again till spring is come. I know he does not do that, for I have often seen squirrels running about on mild and sunny winter days. But he sleeps the greater part of his time in winter, and only wakes up on a day that is fairly warm.

A SQUIRREL'S NEST.

You wonder how he can live for days and weeks without eating anything. In the first place he is in very good condition—plump and well-fed—when he begins his long sleep. He has had a good feast on the autumn fruits—nuts, acorns, and beech-mast. Then, too, no creature needs much food while it is asleep and not moving about.

There is a third explanation. The squirrel makes a store or hoard of food. That is what my squirrel was doing with the walnuts, and what this squirrel is doing with the beech-mast. Somewhere in the hollow of a tree-trunk, or sometimes in a hedge or ditch, squirrels lay up a store of nuts, or acorns, or mast—food which they like and which will keep good for some time. When they wake in the spring, or on a fine day in winter, they know where to go for food.

For his winter sleep the squirrel chooses a warm, snug hole; generally it is in the hollow of a tree, or he will sometimes use a deserted bird's nest. Here he curls himself up in a tight round ball, puts his tiny paws and his thick tail over his eyes, and takes his long nap.

In the spring he builds himself a nest of his own, called a "drey," high up in the fork of some great branch. It is made of dried grass and moss, and has two entrances. In this drey the young squirrels are born. For a few days they are blind, like puppies; then they begin to frisk about with their parents, and in a few days more they are able to take care of themselves and to begin life on their own account.

The squirrel is such a beautiful little fellow that I wish he had no habits that were likely to get him into trouble. There is no doubt that he sometimes robs birds' nests, eating the eggs and even killing the young birds. This is bad for the poor birds, and the squirrel has another habit which is bad for himself. He dearly loves to nibble the bark of young trees, and also to eat the buds in spring. To damage the bark of a young tree will seriously injure its health and growth ; and this is what squirrels, as well as hares and rabbits, often do.

In this way the squirrel is no friend to the forester who wishes to take care of his young trees. I am afraid that many a squirrel who might have had a long and happy life if he only ate nuts and acorns, gets shot by the woodmen for his thefts of buds and bark. We can only hope that *this* squirrel, which has given us so much pleasure in watching him to-day, will not meet with such a fate.

CHAPTER IX

TREE-FELLING

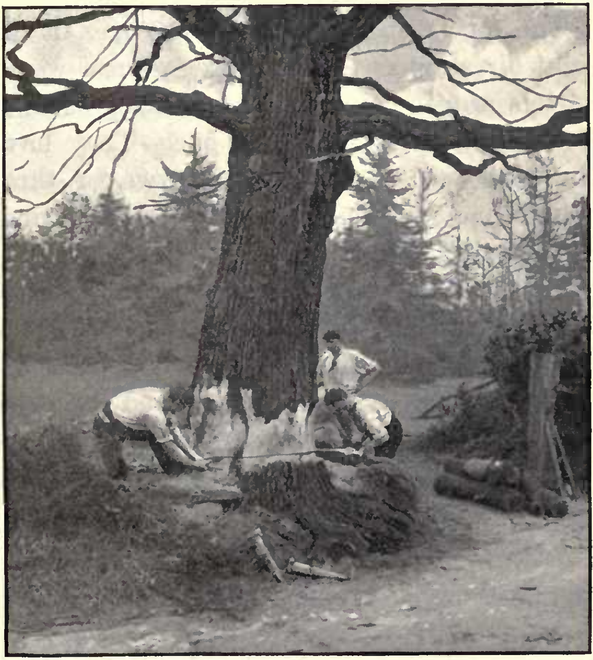
It is February, and once more we are in the forest. We have seen that although the woods are very beautiful in summer there is also much to see there on a winter's day as well. This morning we will see what I daresay few of you have ever seen before; we will see a tree cut down.

The right time at which to fell a tree is in the winter or the early spring. Why? Because at that time the sap is not running. Trees rest during the winter; there are no leaves on them to make food as we saw was done in spring and summer by the leaves of our oak.

When a tree is first cut down the wood is not perfectly dry; it must "season" for some time before it is fit to use as timber. Wood, however, is drier in winter than it is in summer when the sap is flowing in the tree, and therefore winter is the best time for felling.

Oaks are being felled this morning in a plantation not far from the Court House.

When we get there several trees are already lying on the ground, and the men are just setting to work on another. A long rope has been fastened to the top of the tree's trunk, the other end being tied round another tree some distance off. The man who fastened this rope to the top of the oak climbed up some

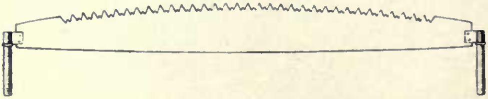


TREE-FELLING.

distance on a ladder. From the top of the ladder he climbed still further up by means of climbing irons—sharp spikes of iron fixed to his boots.

The rope will help to guide the tree in the right direction as it falls. These forest woodcutters are so clever and experienced at their work that they rarely use one. They have the rope to-day, however, for two or three trees stand in rather awkward positions near the oak that is to fall.

The men have also been busy with large axes chopping all round the tree just above the ground. The rough bark has been cut away, and we can see the wood beneath. Presently the axes are put aside and two of the men take a large two-handed saw. They seat themselves on empty sacks on either side of the tree and begin to saw through the trunk, sawing on the opposite side of the tree to that from which the rope is stretched.



TWO-HANDED SAW.

This oak is being felled with the bark on.

Oak bark is used for tanning leather, and formerly it was used a great deal more than it is at the present time. Now there are other methods of tanning, but a good deal of oak bark is still used. The bark is best taken from the tree late in the spring—about the middle of May when the sap is rising. That, as we said just now, is not the best time for cutting down the tree for timber. So the bark is sometimes stripped from the tree in spring, and the tree is left to stand till the following winter before being felled.

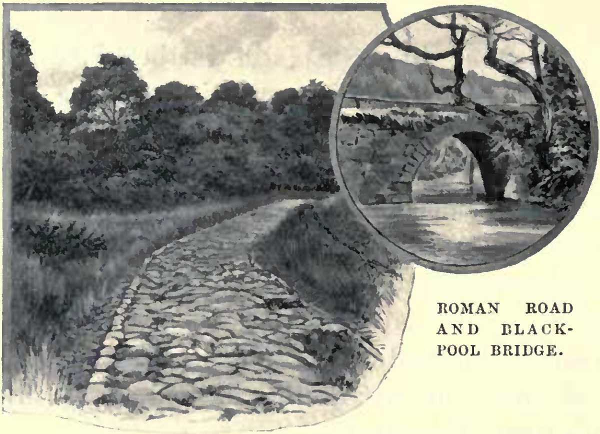
A tree thus stripped of its bark and still standing is rather a sad sight. At night it looks quite ghostly; for the naked wood, without its covering of bark, gleams white in the darkness. Of course only trees which it is intended to fell are stripped in this way; a tree will not live after it has been "barked." The best bark is that which is taken from oak "coppice"; we shall see presently what a coppice is.

The men have been sawing for a few minutes and have now stopped, although they have not sawn half-way through the tree. They have stopped because the weight of that side of the tree is beginning to press upon the saw and they can hardly draw it to and fro. Into the slit cut by the saw a wedge is driven by blows from a heavy mallet. The wedge forces the slit a little further open, the saw can now move freely, and the work goes on again. Every few minutes the wedge is driven in further still, and sometimes more wedges are put in.

As the saw cuts its way through the trunk the whole weight of the great tree rests on the wedges and on the strip of trunk not yet sawn through. At last, when only a narrow strip of wood remains unsawn, the saw is put aside. All the men but one go to the far end of the rope and begin to pull with long strong pulls. The tree bends towards them, but it bends back again ; the strip of unsawn trunk still holds it firm.

The old white-bearded woodcutter who has spent all his life in the forest and is in charge of the work, strikes at the wedges with his heavy mallet and drives them further in. He strikes again and again, while the men pull hard at the rope ; the great tree sways at each pull, but it sways back again and will not fall. Then all at once, after an extra strong pull, the oak does not sway back as it did before; it bends still farther forward. There is a loud tearing, groaning noise as the tree's tough fibres crack and break apart; then the tree bends swiftly forward and falls with a tremendous crash. A cloud of twigs and dust and little clods of earth fly up into the air as the trunk and branches strike the ground. It has taken more than a hundred years of sun and rain and air to make the tall oak grow, but not quite half an hour's work has brought it down.

You see the tree has fallen just in the line along which the rope was stretched. Though the rope was used here, most trees in the forest are felled without one; the old woodcutter knows so well just where to make his men saw, and just how to drive his wedges so as to bring the trees down exactly where he wishes them to fall.



ROMAN ROAD AND BLACKPOOL BRIDGE.

CHAPTER X

A ROMAN ROAD

We have now seen some very old things in our forest. We have seen the Court House, and the house by the river where the great admiral, Sir Francis Drake, is said to have stayed sometimes. We have seen, too, the Great Oak which is nearly a thousand years old, and perhaps even older than that. To-day I want to show you something older still; older than the Court House and older even than the oak; probably older than any house or tree in England. It is a road.

To reach it we must follow one of the three roads that meet at the Court House. After we have walked for a mile or two we turn off the road and go down a broad grassy cart-track which runs between the trees. In about two hundred yards we come to a stream which we can cross by a small one-arched bridge.

But before we reach the bridge we see something we did not expect; suddenly we are no longer walking on soft grass, but on a sort of pavement. It is about eight feet broad, and the stones of which it is made are something like those with which many streets in London and other large towns are paved. They are eight or nine inches square and are set closely and evenly together. On each side of this pavement there is a line of longer and narrower stones set end to end, just as you see the kerbstones of the pavement in a town.

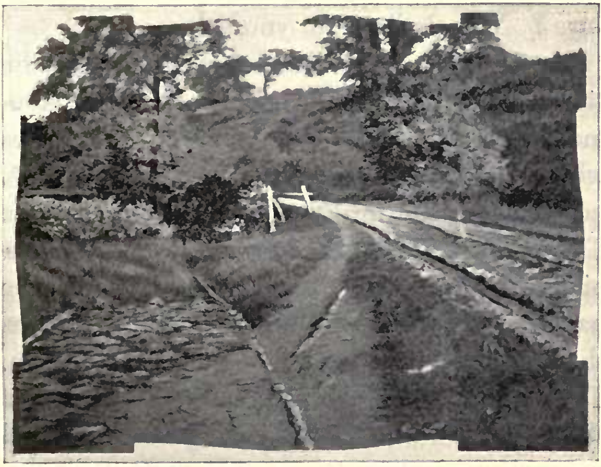
In nearly fifty yards of the pavement there is hardly a stone missing. It is a little rough and uneven in places, for some of the stones have sunk into the ground more than others. We cannot wonder at this; for the Romans made this paved road nearly two thousand years ago, and it has not been mended or altered since they left England.

The Romans made a great many roads all over England, and all of them were well and strongly made. However muddy and wet the country might be in winter, and however bad the weather, the Romans had good firm roads over which their soldiers could march at any time. Whatever the Romans did they did well.

Very few of these roads are now left just as the Romans made them. The names of the roads often remain ; Watling Street in London is part of one of these great roads, and the names of other Roman roads are still left. The pavement of the roads themselves is very seldom to be seen ; the stones have often been taken away and used for building. Sometimes a piece of Roman road is discovered in some field where it has long been buried under earth and grass. We do not often find so good a piece of Roman road as this.

If we look closely at the long kerb-stones on each side of the road we shall see that they are propped up by other stones. These are sunk deeply into the ground on the outer side of the kerb. In this position they kept the kerb-stones from being forced out of place by the passing of large numbers of soldiers over the road, or by the weight of heavy loads.

In about eighty yards the road reaches the stream; it dips down almost to the edge of the water and we see it on the opposite side.



DIVERGENT KERB ON ROMAN ROAD.

Once the bottom of the stream itself was paved just here; there was a paved ford. A ford is a place where a river or stream is shallow and can be crossed without a bridge. The water has long ago washed away the paving-stones, though some perhaps still lie buried in the mud.

As the stream is just a little too wide for us to step across we will go over the bridge. The bridge, too, is old, but not nearly so old as the road—only a hundred years or so. I am quite sure, however, that the Romans had a bridge here in their time. How can I be sure? You shall see for yourselves.

If we go back a little distance from the stream and look along one side of the pavement, we shall find one or two kerb-stones which turn away from the others and point, not towards the ford, but towards the bridge. They are evidently the kerb-stones of another piece of road which branched off from the paved road we see; they turn off exactly as the points of a railway line do at a junction. These kerb-stones are quite enough to show us that the Romans had a bridge and a road across it, as well as the road through the ford.

We cannot be quite certain why the Romans made a road through the stream as well as over their bridge. I think that most likely they first made the road through the stream in summer when the water was low. Then they found that in winter, or after heavy rain, the water of the stream rose higher than they had expected, and so they had to build a bridge.

Timber-waggons come down the hill on the other side of the stream—the oak which we have seen felled will come this way. The waggons cross the little bridge and go along the green lane to the high-road, and the weight of their heavy loads has destroyed the old road that led across the bridge. They do not use the pavement which runs towards the ford, and so it is almost as perfect to-day as when it was made.

Up the hill across the stream we can still find remains of the road for a long way. Now we see a small piece of pavement half hidden among grass and gorse; here and there are a few kerb-stones still in place.

These fragments are hardly so interesting to look at as the strip of road beside the ford. Indeed, I think this paved Roman road is one of the most wonderful things in the forest. All round us as we sit beside the stream are great old trees; yet the road is older than the very oldest of them—older than anything here except the earth on which we sit and the small rippling stream. Roman soldiers, carrying their shields and short strong two-edged swords, have marched along upon these very stones. The great Emperor Hadrian, too, has very likely passed this way; for he was once in England and used to walk bare-headed through the country twenty miles a day.

CHAPTER XI

A COPPICE

In the plantation of young oaks which we saw in June there were no small bushes or "underwood" among the trees; there was nothing but grass and fern. Such a wood, where only tall trees are grown, is called "high forest" or "highwoods." Often, however, smaller trees are grown among the large ones, and are cut down every few years. A wood in which such underwood is grown among tall trees is called a "copse."

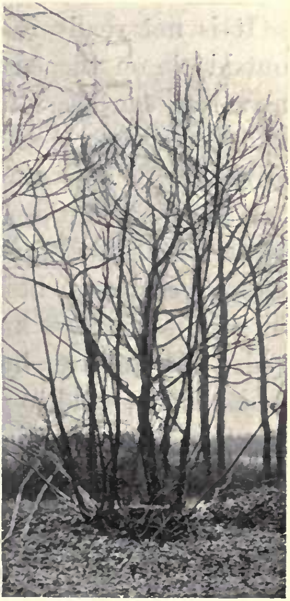
To-day we will visit a "coppice." A coppice or "pure coppice," is a wood in which no trees are allowed to grow very large; they are cut down while young. There are many purposes for which coppice wood is useful. In those parts of England where hops are grown many hop-poles are needed, and young Spanish Chestnuts and other trees are grown in

CUTTING AND CARTING BRACKEN.

1. IN THE HOLLY WOOD. 2. A FINE HOLLY.
3. A CHURCHYARD YEW.

coppices to produce these. Reels and bobbins are made from the wood of the birch; ash and hazel are used for hurdles and for the hoops of casks. Wood for these and many other purposes can be grown in a coppice.

The life of the tall oak we saw cut down is perhaps not quite over. Though, of course, no large trunk will grow again from its roots, small shoots may do so if the roots are not grubbed up.


SHOOTS GROWING FROM A STOOL.

Such shoots grow still more quickly from the stump, or "stool" as it is called, of the ash, the hazel, and several other trees, especially if the main stem of the tree has been cut down while young. When these shoots have grown for a few years they are large enough to make poles, hurdles, and other things. When they are cut fresh crops of shoots will appear from the stool, and so on for many years. It is a coppice where the trees are frequently cut in this way, that we are now going to see.

It is not really in the forest, but lies just outside it on the edge of a hill. This afternoon we can see all over it, for every tree and bush has been cut down close to the ground.

Near us is a large stack of small bushy sticks tied into bundles; each bundle looks like a very large besom, or like an immense birch-rod—but *you* know nothing about birch-rods! These are bundles of "pea-sticks" which will be sold to people who have gardens. Most of these pea-sticks are hazel.

Then there are long narrow piles of logs, propped up at each end by a stout stake driven into the ground. Each of these piles is a "cord" of firewood. Firewood is usually sold by measure, and a cord here is eighteen feet three inches long, three feet five inches high, and the logs two feet two inches in length. But the measurements of a cord are quite different in different parts of the country.

Down at the far end of the coppice there is a man at work beside a little fire of chips;

every now and then we can see the sunlight flash on the tool which he is using. We will go over and see what he is doing.

I see that he is an old friend of mine. His hair is white and his face is rough and red; he has been working in the open air, summer and winter alike, for more than fifty years. He will tell you that he has never been ill in his life. He knows all about every sort of woodland work, from felling a tree to making hurdles.

Just now he is making hoops for casks. Casks which contain liquids, such as beer or wine, are usually hooped with iron. Rough casks with wooden hoops are used for many purposes, such as for packing crockery, groceries, and fruit.

In front of him the hoop-maker has a small wooden stand. His tools are a chopper and a "draw-knife," and he wears a short leather apron to which is fastened a thick block of wood. Piled in heaps are sticks of different lengths; some are only about five feet long, others are as much as thirteen.

He takes a stick from the pile and measures it between two small pegs stuck in the ground. It is a little too long, so he cuts off a few inches with his chopper and also trims away two or three knots from the stick. He then fixes one end of it in a slit in his trestle and makes it fast with a wedge.

CUTTING RODS TO UNIFORM LENGTHS.

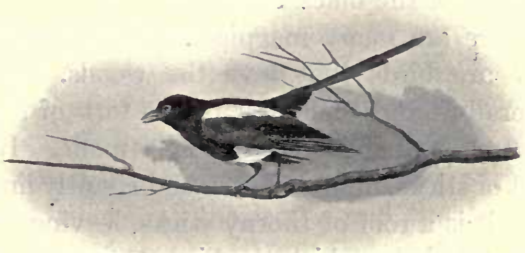
Now he draws his knife towards him all down one side of the stick, paring off the bark and making that side flat and smooth; that is the side which will go next the cask. The apron keeps his coat from being rubbed by the loose end of the stick, and as he finishes each stroke, the draw-knife comes against the block of wood.

While the old man works he talks to us about the woods and the weather, and about a fox which he saw yesterday at the edge of the coppice. His hands work while he is talking, and presently he has finished enough hoops to make a bundle. He binds them together with a tough thin stick; they are now ready to be taken to the town. Some hoop-makers also bend the hoops to fit the casks, but these are to be bent at the place where the casks are made.

CHAPTER XII

SOME FRIENDS AND FOES

As we are returning to the forest, a large black and white bird flies up from beside the hedge and alights on the branch of a tree. As it alights it flirts up its tail. It is a magpie, and many country people would not like to see it, for there is a superstition that to see one magpie brings bad luck. Even if we believe in luck we need not be troubled to-day, for a second magpie follows the first, and an old rhyme about the bird begins—



MAGPIE.

One for sorrow, two for mirth.

At first sight the magpie looked much larger than it really is. Its body is not more than about seven inches long, but its tail is often as much as ten or eleven inches. The under part of its body is white, and there is also a white patch on each shoulder. As it flew we saw more white still, for some of the wing feathers which are only seen when the bird is flying are white too. Its head, back, and the upper feathers of its wings are black, but there are slight tints of blue and bronze on some of the black feathers.

There are many magpies in the forest, for they are birds that love the woods. They generally build their nest in the fork of some tall tree, and it is very strongly made. It is built of sticks, mud and turf, and is softly lined. Over it is a roof of thorny sticks, leaving only a small hole by which the birds enter.

There are very few small living things in the forest which the magpie will not eat if it can get them. It will take the eggs of other birds, and young birds too. Young rabbits, squirrels, or even a leveret—a young hare—are all welcome. If these are not to be had it can put up with mice, frogs, worms, and caterpillars.

We have not had much time to talk of the animals and birds in the forest because we have been looking mostly at the trees. The animals, birds and insects which live in the woods are, however, very important to the forester, for many of them do either good or harm to his trees.

We have said that hares, rabbits, and squirrels often do much damage by eating the bark and the buds. They do this most in hard winters, when snow is on the ground and they cannot easily find other food. Rabbits and hares can generally be killed, or kept out of young plantations by wire netting. In our forest there are very few rabbits.

The greatest foes to the forester and his trees are insects. There are insects which attack every kind of tree and every part of a tree. Some eat the leaves and thus prevent the tree from breathing and making food. Sometimes an oak will be entirely stripped of its first crop of young leaves in the early summer. If this happens to a strong and healthy oak, more leaves will "flush" in July, but this takes some of the strength which should have been used for making wood.

Oak leaves are eaten in this way by the caterpillars of the Green Oak Moth, a small moth whose upper wings are green. Another grub feeds on the leaves of the spruce; and if the leaves are eaten off a spruce the tree is almost certain to die, for it is less able than the oak to recover from such damage.

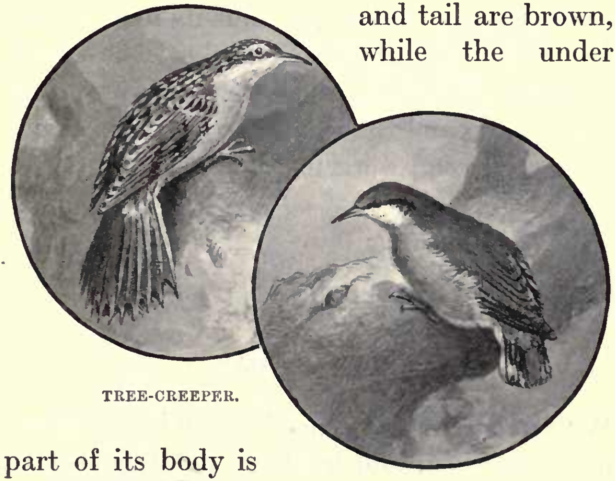
The grubs of wood-wasps are among the enemies which bore their way into the wood of trees, thus spoiling it for use as timber. The roots, bark, and buds all have their special insect foes. So many different insects attack the oak alone that it would take us a long time to talk about them.

WOOD-WASP AND GRUB.

Some insects, however, are very welcome in the woods; for they feed on, or otherwise destroy, the harmful ones. Many beetles, flies, and wasps eat insects; and ants devour large numbers of "larvæ" or grubs. Others, while they do not actually eat insects or their grubs, destroy them in another way. They lay their eggs in the bodies of grubs or caterpillars; the eggs produce grubs, and these eat their way out of the grub in which they were hatched, leaving it exhausted and dying.

Other friends of the forester are foxes, badgers, weasels, and hedgehogs, which all eat large quantities of grubs and beetles.

Then, too, the forester has a friend in every insect-eating bird. Here is one—a small bird which we see climbing the trunk of an oak. Its back, wings, and tail are brown, while the under part of its body is white; its beak is long and slightly curved. It is a "tree-creeper," and the insects which it finds among the bark are its chief food; its long beak can reach them even in deep crevices.



TREE-CREEPER.

NUT-HATCH.

We watch the bird as it creeps up the tree; now it is on our side, now on the other out of sight. Presently it leaves the oak, flies to the foot of another tree close by, and begins its climb again. The tree-creeper never works downwards; it always begins its hunt at the bottom of a trunk or bough.

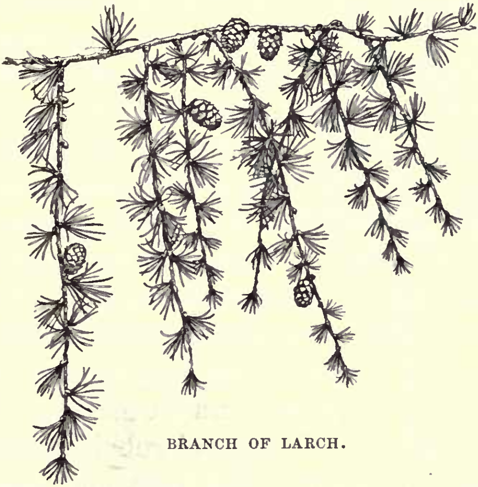
The nut-hatch, a grey-backed bird, also climbs trees at times and finds its food among the bark. The green woodpecker, whose loud laughing call rings through the woods in spring; the starling and the cuckoo ; these, and many others, do good work for the forester.

CHAPTER XIII

OUR LAST DAY

We are only able to spend a day in the forest now and then, and we have not time to see all that goes on, nor to look at every kind of tree which grows there. Perhaps you will wonder that we have not spoken of the elm, but there are very few elms in the forest—not more than a dozen altogether. The elm is not a tree of the woods, but of the field and hedgerow. Its timber is not very valuable, though it is used for making coffins.

We must, however, speak of the larch, and just now we happen to be walking through a larch plantation. The boughs are bare, but in summer you might think that the larch was an evergreen; its leaves or needles are much like those of other evergreens, such as the spruce and the yew. They are long, very narrow, and sharp at the end. The larch also bears cones about an inch long; it is almost the only conifer that is *not* an evergreen.



BRANCH OF LARCH.

The leaflets of the yew, as we saw, grow closely together in two rows, on opposite sides of the twig. Those of the spruce grow thickly all round the twig. If we looked at the larch in summer when the needles are on the trees, we should find that they grow in a different way from those of the yew or the spruce. Clusters of thirty or forty needles grow at short intervals along the twig. Even to-day we can see on the twigs the places from which these clusters of needles have dropped.

A century and a half ago the larch was almost unknown in England, for it is not an indigenous tree here. In 1738 two or three tiny larches were sent from Europe as a curiosity to a gentleman in Scotland. This gentleman's gardener wished to take great care of them; but he did not know that the larch thrives best in a cold climate, so he put them in the hot-house! Here the young plants soon withered and drooped, and the gardener threw them out on to a heap of rubbish. In the open air they revived, took root, and began to grow well. One of them was planted on the lawn before the gentleman's house and lived till a very few years ago.

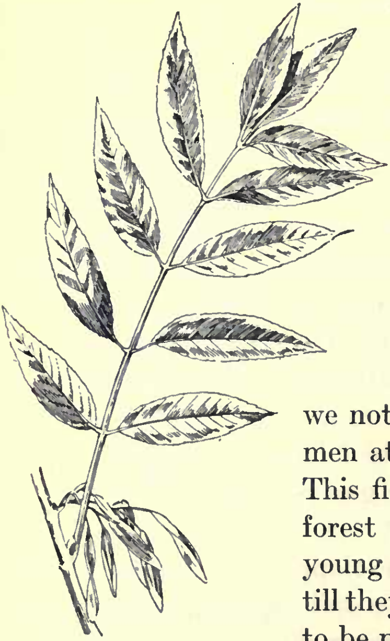
Millions of larches are now grown in England, for it is a most useful tree. It grows quickly, with a straight stem, and its wood is tough and durable.

Just at the end of the larch plantation stand two tall and graceful trees, one on each side of the path. The tree on our right has branches the ends of which hang down, and they are so light and slender that they sway to and fro even in the gentlest breeze. The bark is shining and silvery, but this has peeled off in places, and the darker wood beneath gives the stem a dappled appearance. This is a birch, which is, perhaps, the most graceful tree we have.

BIRCH IN WINTER.

Now look at the slope of that hill half a mile away, which is covered with uncut coppice wood. The sun is shining on it, and the hill glows with a rich purple colour. The coppice is birch, and it is the stems and buds of the young birches that have this beautiful purple colour all through the winter.

The tree on our left is an ash. The lower branches hang down, but they are stouter than those of the birch. Even the twigs at the ends of the branches are thick and blunt, and they turn slightly upwards instead of pointing to the ground.



LEAF AND SEEDS OF ASH

Just outside a village which we have reached we notice several young men at work in a field. This field is part of the forest "nursery" where young trees are grown till they are large enough to be planted out in the woods. The seed of trees is sometimes sown in the place where they are to grow all their lives; more often the seed is sown in the nursery, and the young trees remain there till they are large enough to be transplanted.

In the open woods very tiny trees might be trampled on, or smothered among grass and weeds. Rabbits, or our friend the squirrel, might gnaw the tender bark. In the nursery the baby trees can be well looked after.

Here are many rows of tiny trees, some of them only a few inches high. Spruces and larches are here, as well as beeches and several sorts of pine. The men at work are digging up some of the little trees which are now old enough to be planted out.

A little further on, in the village, is a large building; the door is open and we go in. There are seats and desks, and it is evidently a kind of schoolroom. There are also a great many pieces of wood—" sections " of the branches and trunks of trees. Round the walls are glass cases containing moths, caterpillars, and beetles.

This is a " School of Forestry." This forest belongs to the Government—it is a " Crown Forest " ; the growing of the trees and all the work of the woods is managed in the best possible way. The Government has recently established this school in which to train young men to become good foresters.

The pupils spend their time partly in the school, and partly working in the woods. They are taught in the woods the right way of planting a young tree and how to treat it as it grows. They learn to recognise harmful insects when they see them, and also the signs of disease in trees—for trees suffer from diseases just as human beings and animals do. In the school the young men hear lectures on these insects and tree-diseases, and on everything which a forester ought to know.

I think it is a fine life for which they are being trained. It is a healthy life; men who work in the woods suffer little from illness. It is interesting work, too, to plant a tree, to watch it growing year by year, and to help it to grow large and strong by keeping it free from disease and from the attacks of insects.

And the forester's life is a very useful life. Many people now think that it would be a good thing if some of our waste land were planted with trees; the woods we have, too, are not always managed as well as they should be. Trees make work; work for the woodmen who tend them while they grow, and cut them down; and work for those who use the timber which the trees produce.

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